



NORTH CAROLINA
Department of Transportation



Roundabouts in North Carolina

April 2018 BOT Highway Committee Meeting

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4 April 2018

- 3 Types of Circular Intersections
 - Traffic Circle



- 3 Types of Circular Intersections
 - Traffic Circle
 - Traffic Calming Intersection



- 3 Types of Circular Intersections
 - Traffic Circle
 - Traffic Calming Intersection
 - Modern Roundabout



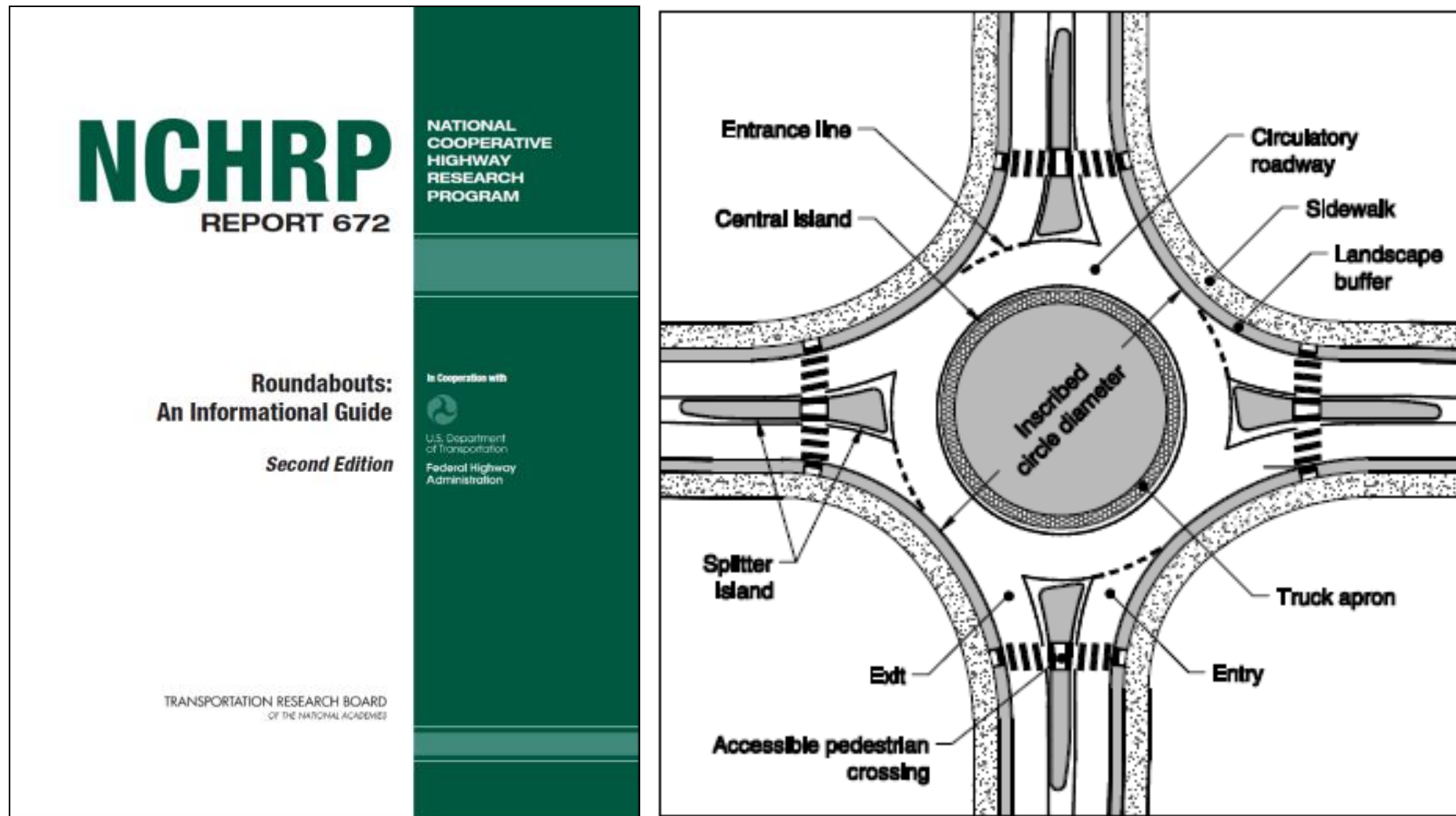
Size

- Traffic Circle - 800' Diameter
- Roundabout - 180' Diameter
(Range is typically 90'-180')



- Safest Intersection
- High Capacity / Low Delay
- Good for All Modes of Traffic
- Geometric Flexibility
- Aesthetics

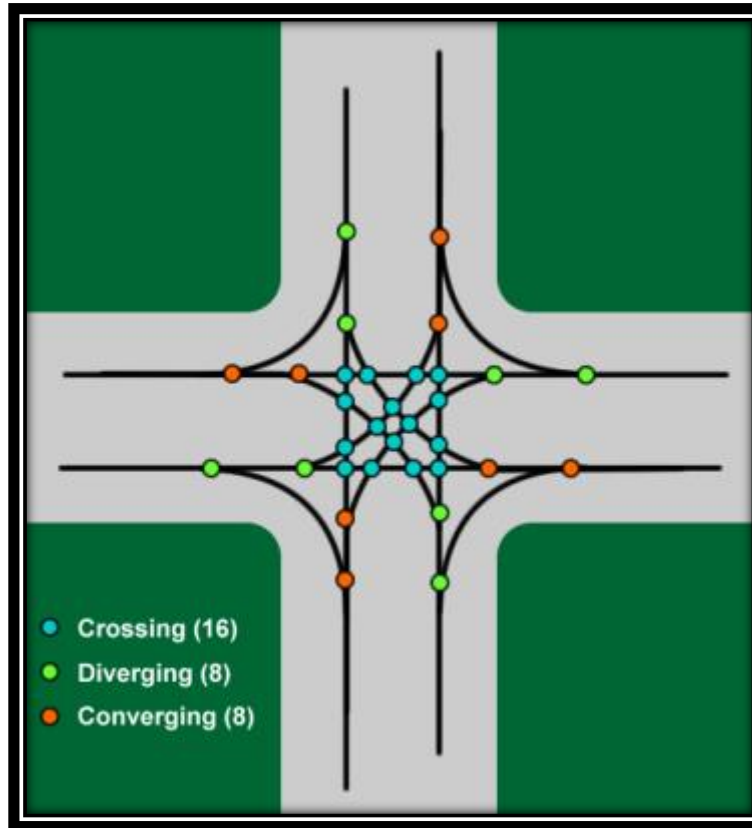




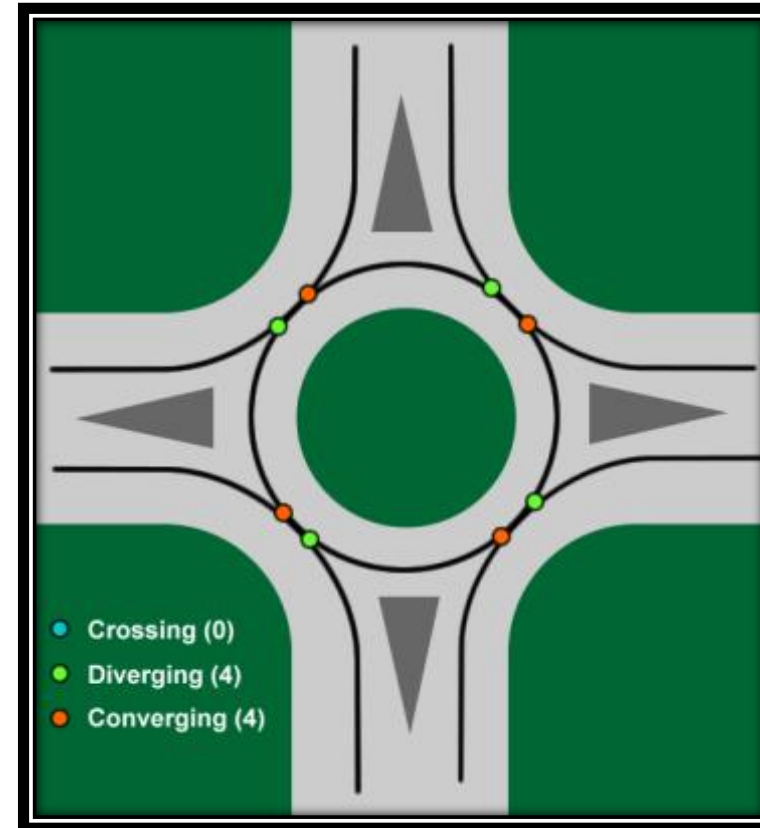
http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_672.pdf

Roundabouts – Safety

Conflict Points



There are 32 conflict points at a conventional intersection.



There are only 8 conflict points at a modern roundabout

A **conflict point** is the **point** at which a roadway user crossing, merging with, or diverging from a road or driveway **conflicts** with another roadway user using the same road or driveway. It is any **point** where the paths of two through or turning vehicles diverge, merge, or cross

Crash Reductions Following Installation of Roundabouts

In the United States

- Total Crashes 48%
- Fatal/Injury Crashes in Rural Areas 78%
- Fatal/Injury Crashes in Urban Areas 60%

In North Carolina

- Total Crashes 46%
- Fatal/Injury Crashes 76%
- Frontal Impact Crashes 75%

Sources:

Insurance Institute For Highway Safety

NCHRP Report 572

NCDOT Safety Evaluation Group

www.highwaysafety.org

onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_572.pdf

<https://connect.ncdot.gov/resources/safety/TrafficSafetyResources/Roundabouts.pdf>

- Peak Hour Traffic – Usually at least as efficient (same overall delay to drivers) as traffic signals
- Off Peak Traffic – Usually much more efficient than traffic signals.
- Multi-lane roundabouts can handle as much traffic as a busy signalized intersection

Roundabouts provide a safer crossing for pedestrians



Roundabouts provide safer travel for cyclists



Buses do not have trouble negotiating the roundabout, and provide a good location for bus stops





I-485 at Prosperity Church Road in Charlotte



- Roundabouts can be designed as ovals and oblong shapes in order to achieve better movement separation and accommodate unique intersection geometry
- Works well for offset T-type and multiple legged intersections



Roundabouts – Landscaping



When a roundabout is recommended for an intersection there typically is some public resistance. Some of the complaints and questions we frequently hear/deal with:

- Driver Expectation
- Large Trucks
- Emergency Vehicle Access
- Cost and Maintenance
- Older Drivers will get confused and crash





Clearwater Florida Fire Chief Video:

https://www.youtube.com/watch?v=N4AY_R_6bZI

- Average single lane roundabout construction costs about **\$900,000**
- Maintenance is minimal (mostly mowing; any additional landscaping is done by others)
- Signalized intersection costs are about **\$50,000-200,000**
- Signal maintenance costs are about **\$3,000-5,000** annually
- Construction of turn lanes is about **\$175,000-\$250,000**

Modern Roundabouts | A LIVABILITY FACT SHEET

Every day in the U.S. more than 20 people are killed at traffic intersections, and many more are seriously injured.¹

Roundabouts — circular intersections that move traffic counterclockwise around a central island — can help reduce these deaths and injuries. Modern roundabouts are calmer and safer than conventional intersections and have been deemed a “proven safety counter-measure” by the U.S. Department of Transportation.²

Roughly the size of a baseball field, modern roundabouts differ from rotaries or traffic circles, which can be as big as the stadium itself. Roundabouts feature lower, safer vehicle speeds. They can be 80 feet across with single lanes carrying 25,000 vehicles a day or larger at 200 feet, with double lanes and 45,000 vehicles a day.³

Personal injuries and fatalities plummet as much as 90 percent in modern roundabouts when compared to conventional intersections.⁴ Roundabouts cause drivers to slow down, ideally to less than 20 mph, which reduces the risks to both pedestrians and drivers.

Because roundabouts can handle 30 to 50 percent more traffic than conventional intersections, they reduce travel delays.⁵ Since roundabouts can be designed to be aesthetically pleasing, they help create a sense of place.

By January 2014, roundabouts graced more than 2,000 intersections in the U.S., with more planned.⁶ Given their safety and placemaking benefits, roundabouts should be considered for many more of the three million intersections in the U.S.

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Vehicle speeds on Grandview Drive in University Place, Wash., often reached or exceeded 50 mph. After the installation of modern roundabouts, vehicle crashes dropped from one every nine months to zero in 14 years.



Myth-Busting!

“Roundabouts aren’t good for older adults.” By 2025, about 25 percent of all drivers in the United States will be over the age of 65. Forty percent of all car crashes that involve drivers over the age of 65 occur at intersections.

As we age, we lose our ability as drivers to judge left turn gaps. Roundabouts don’t require those decisions, and they eliminate head-on and right-angle crashes. When collisions do occur, they are generally at lower speeds and less harmful.

<https://www.aarp.org/content/dam/aarp/livable-communities/documents-2014/Livability%20Fact%20Sheets/AARPLivabilityFactSheet-Modern-Roundabouts-33116.pdf>

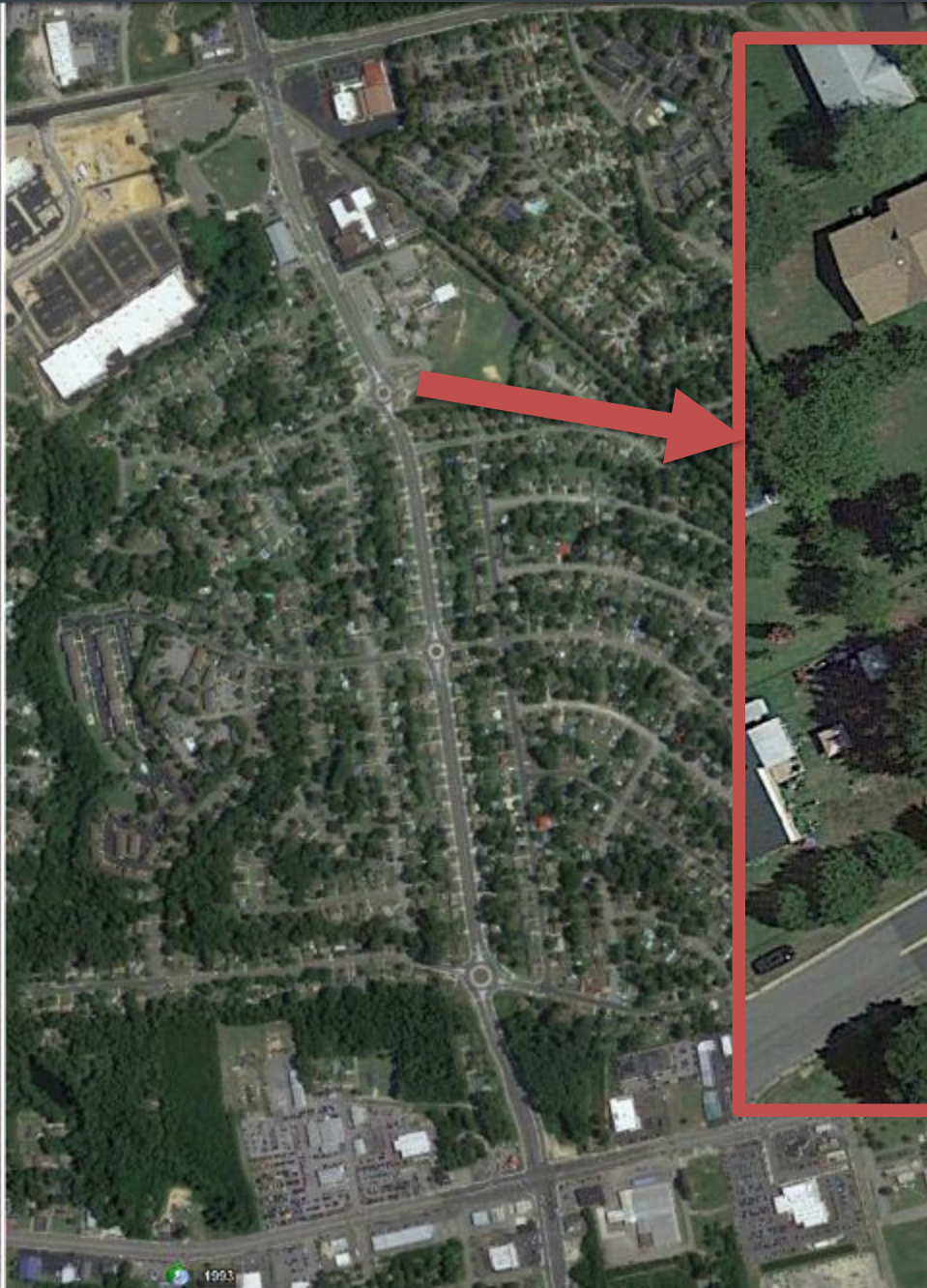




NC State, Raleigh



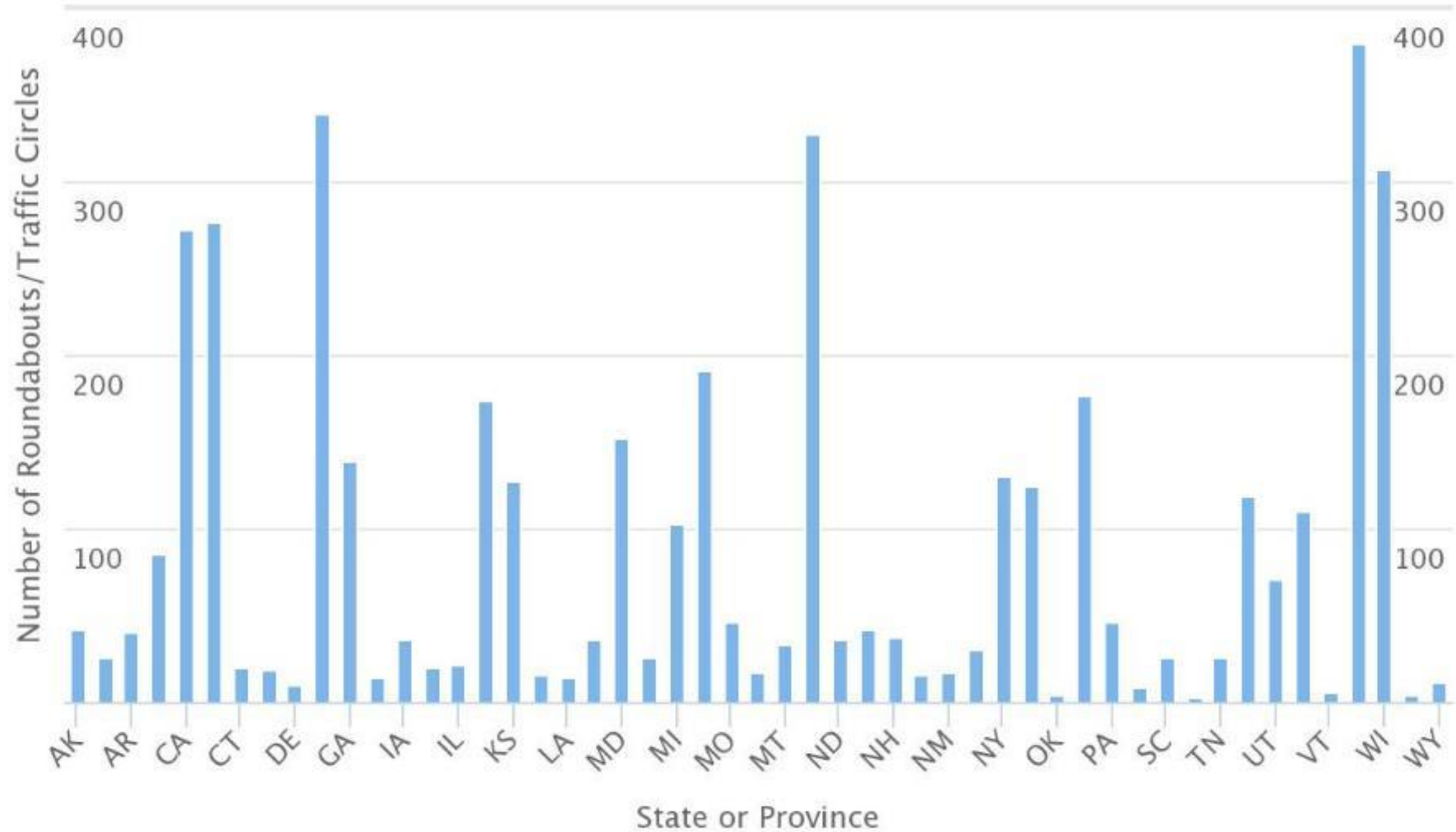
NC 22, Moore County



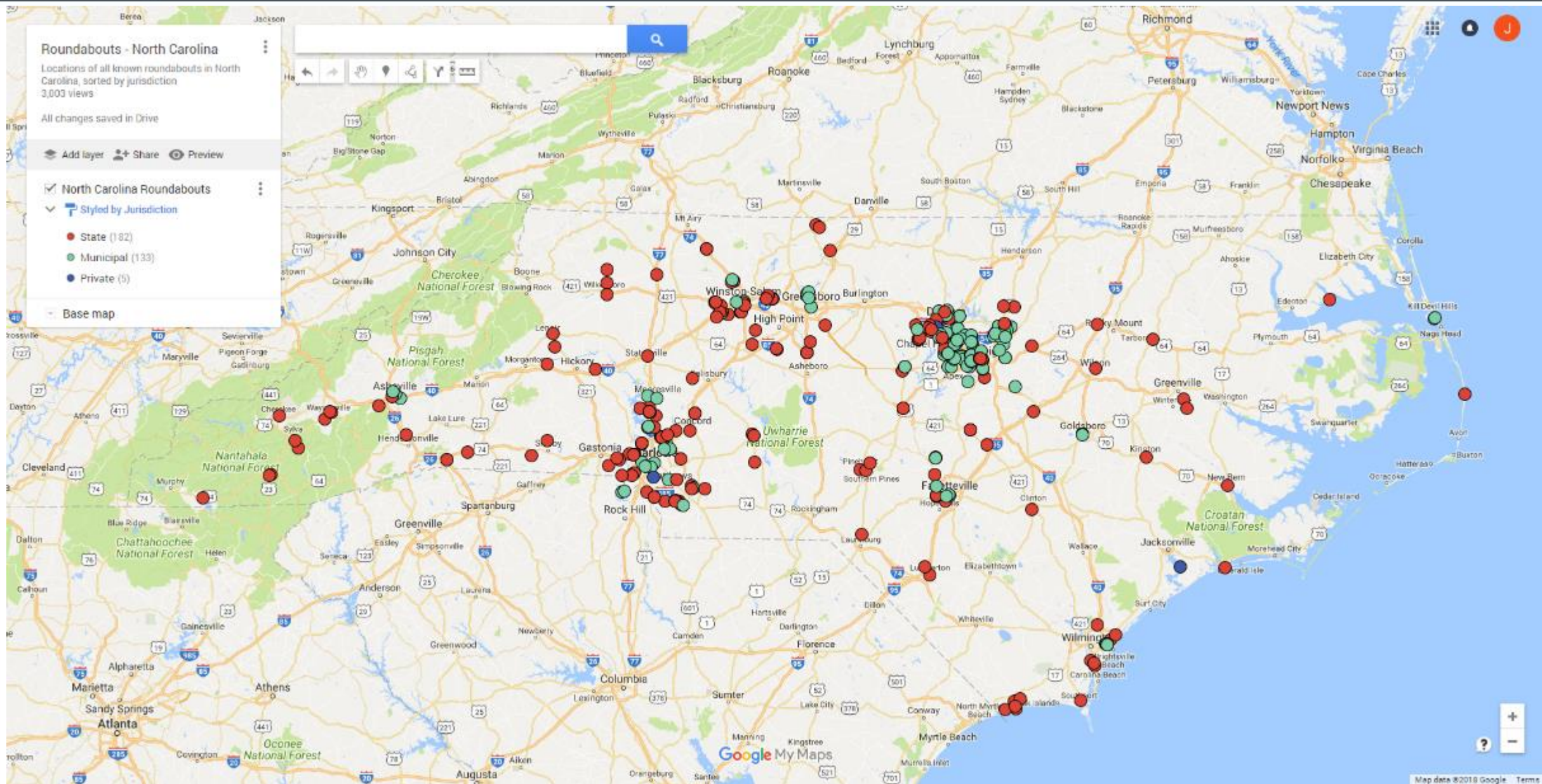
Fayetteville – Glensford Drive

- There are over 300 roundabouts in the State, over half on the State road system
- The majority of the roundabouts in the State are single lane with four approaches
- Multilane roundabouts make up about 10% of the State's total
- Downtown areas
- Interchange ramps
- Each of the State's 14 Transportation Divisions has at least one roundabout in operation

Roundabouts/Traffic Circles by State/Province



Highcharts.com



<https://drive.google.com/open?id=1td2bXCUNCQROX5jK5f9D5Ezr1Y&usp=sharing>